COURSE OVERVIEW PE0067

Asset Operational Integrity for Operations - Fundamentals (E-Learning Module)

Course Title

Asset Operational Integrity for Operations – Fundamentals (E-Learning Module)

Course Reference

PE0067

Course Format & Compatibility

SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration

30 online contact hours
(3.0 CEUs/30 PDHs)

Course Description

This E-Learning course is designed to provide participants with a detailed and up-to-date overview of fundamental asset operational integrity for operations. It covers the process safety and personal safety; the main hazards in gas processing, transportation and distribution facilities; the hazards inherent in oil and gas including the different forms of hydrocarbons, flammability, explosivity, explosive limits, density, pressure, toxicity/asphyxia, gas, condensates and chemicals; and the properties and hazards of gases, micro-biocides anti-bacterial treatments and hazards and risk controls for additives.

Further, the course will also discuss the asset/operational integrity and asset integrity risk management process; the barriers and risk management terminology and management system elements; the risk management in emergency, effective risk management, risk-based funding and resource allocation and measuring risk; the risk communication, strategic planning, risk management practices, hazard identification and hazard analysis; the risk assessment, risk matrix, risk-based planning and social vulnerability; the safety critical equipment; the permit to work procedure; the lockout work rules, equipment lockout capabilities, safe isolation of plant and equipment and management of change.

During this interactive course, participants will learn the proactive monitoring of plant and facilities; the maintenance technologies; the reactive maintenance, preventive maintenance, predictive maintenance (PdM), proactive maintenance and self-maintenance; the benefits and requirements of predictive maintenance; the emergency depressurization, emergency shut down (ESD) and fire and gas system; the importance of inspection and test in asset integrity management and corrosion; the asset integrity management; the role of operating personnel in maintaining asset/operational integrity.

Course Objectives

At the end of this course, the Trainee will be able to:-

- Apply and gain a fundamental knowledge on asset operational integrity for operations
- Differentiate between process/operational safety and personal safety
- List the main hazards in gas processing, transportation and distribution facilities
- Explain terms related to asset/operational integrity (hazards, consequences, risks, barriers (controls), failure, top event, reliability, availability etc.)
- With the help of models such as swiss cheese model, bow tie etc. explain the role of barriers (controls) in maintaining process safety
- Explain the risk in normal operations and emergency conditions
- Define the concept of major failures and explain the process to identify criticality and safety critical elements
- Explain safe systems of work (PTW), safe isolation of plant and equipment (SIOPE) and management of change (MoC)
- Describe what is meant by proactive monitoring of plant and facilities
- Provide examples of proactive monitoring in field surveillance rounds and patrol duties
- Differentiate between emergency depressurization and emergency shut down (ESD)
- List the different levels of ESD-describe the function of fire & gas system
- Explain the importance of inspection and test in asset integrity management
- Define corrosion and list out the different types of corrosion in gas processing, transportation and distribution facilities
- Explain the role of operating personnel in maintaining asset/operational integrity
- Differentiate process safety and personal safety as well as identify the main hazards in gas processing, transportation and distribution facilities
- Discuss the hazards inherent in oil and gas including the different forms of hydrocarbons, flammability, explosivity, explosive limits, density, pressure, toxicity/asphyxia, gas, condensates and chemicals

- Recognize the properties and hazards of gases, micro-biocides anti-bacterial treatments and hazards and risk controls for additives
- Implement asset/operational integrity and asset integrity risk management process as well as discuss the barriers and risk management terminology and management system elements
- Employ risk management in emergency, effective risk management, risk-based funding and resource allocation and measuring risk
- Apply risk communication, strategic planning, risk management practices, hazard identification and hazard analysis
- Employ risk assessment, risk matrix, risk-based planning and social vulnerability as well as identify safety critical equipment
- Carryout permit to work procedure and discuss the lockout work rules, equipment lockout capabilities, safe isolation of plant and equipment and management of change
- Apply proactive monitoring of plant and facilities and discuss maintenance technologies
- Implement reactive maintenance, preventive maintenance, predictive maintenance (PdM), proactive maintenance and self-maintenance
- Identify the benefits and requirements of predictive maintenance as well as emergency depressurization, emergency shut down (ESD) and fire and gas system
- Recognize the importance of inspection and test in asset integrity management and corrosion
- Employ asset integrity management and identify the role of operating personnel in maintaining asset/operational integrity

Who Should Attend

This course provides an overview of all significant aspects and considerations of fundamental asset operational integrity for operations for This course provides an overview of all significant aspects and considerations of asset integrity and engineered safety for technical managers, inspection and maintenance managers, safety managers, engineers, superintendents, supervisors, foremen and safety staff in refineries, petrochemical plants and oil/gas process plants who are engaged directly or indirectly in engineered safety and/or technical integrity.

Course Fee

As per proposal

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- USA International Association for Continuing Education and Training (IACET)

  Haward Technology is an Authorized Training Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 1-2013 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 1-2013 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Contents

- Differences between process safety and personal safety
- Process safety incidents happen at a lower frequency
- Process safety prevents hazardous releases
- Process safety protects everyone
- Process safety considers humans, the environment and business
- Process safety focuses on changing systems
- Process safety is expensive
- Process safety is misunderstood
- Process safety deals with major hazards
- Process safety needs high level support
- Process safety should be discussed by all
- Process and occupational safety are both important
- Case study #1
- Quiz #1
- The main hazards in gas processing, transportation and distribution facilities
- Hazards Inherent in Oil and Gas
- What is Hydrocarbon
- Different Forms of Hydrocarbons
- Gas: What creates a danger
- Flammability

- Explosivity
- Explosive Limits
- Gas: Density buoyancy:
- Density
- Pressure
- Gas: Prevention
- Pressure
- Toxicity/Asphyxia
- Toxicity
- Gas
- Condensates, Chemicals
- Hazards Inherent in Oil and Gas
- Classification of Flammability
- Flammability Limits
- Toxicity
- Properties and Hazards of Gases
- Methane – (natural gas)
- LPG (Liquefied Petroleum Gas) as Propane/Butane – (fuel)
- LNG (Liquefied Natural Gas) – (fuel)
- Nitrogen
- Hydrogen sulphide
- Oxygen
- Anti-foaming agents
- Anti-wetting agents
- Micro-biocides anti-bacterial treatments
- Hazards and Risk Controls for Additives
- Hazards
- Risk Controls
- Water and Steam
- The hazards
- Safe handling
- Mercaptans (a group of sulphur containing chemicals)
- Drilling muds (drilling fluids)

- Sludges (drilling wastes)
- Industry-Specific Impacts and Management
- Case study #2
- Quiz #2
- Asset/Operational Integrity
- Introduction
- Asset integrity risk management process
- Step 1. Establishing the context
- Step 2. Communication & consultation
- Step 3. Risk assessment
- Step 4. Risk treatment
- Step 5. Monitoring and review
- Case study #3
- Quiz #3
- Barriers and Risk Management Terminology
- Barriers
- Hardware barriers
- Human barriers
- Management System Elements
- Glossary
- Case study #4
- Quiz #4
- Risk Management in Emergency
- Risk-Based
- Objectives: Students will be able to
- Scope
- Readings
- Define “risk-driven”
- Effective risk management
- Risk-Driven
- How do emergency managers address risk?
- Risk-Based Funding and Resource Allocation
- Measuring Risk

- Risk Communication
- Strategic Planning
- Effective public and private sector risk management practices
- Risk communication can be improved
- Better Risk Management
- Hazard Identification
- Hazard Analysis
- Risk Assessment
- Risk Matrix
- EMAP Standard
- Risk-Based Planning
- Social Vulnerability
- Case study #5
- Quiz #5
- Safety Critical Elements
- Overview
- Introduction
- Purpose
- Scope
- Identification of Safety Critical Equipment
- Approach 1: Prescriptive – Generic
- Approach 2: Risk Based- Qualitative – Generic
- Approach 3: Risk Based- Semi-Quantitative – Generic or Facility Specific
- Approach 4: Risk Based- Quantitative – Facility Specific
- Summary
- Safeguards
- Appendix: Examples of Safety Critical Equipment Identified by one CAPP – Canada's Oil & Natural Gas Producers member
- Approach 2: Risk Based – Qualitative – Generic
- Case study #6
- Quiz #6
- PTW, SIOPE and MoC
- Permits-to-Work
- Permit to Work Procedure

- Objectives of the PTW System
- Principle Responsibilities for the PTW System
- Company Lockout Program & Policies
- Program Purpose
- Lockout Work Rules
- Equipment Lockout Capabilities
- Procedures
- Permit to Work Form
- The safe isolation of plant and equipment
- Overview of isolation hazards
- Overview of Management of Change
- Case study #7
- Quiz #7
- Proactive Monitoring of Plant and Facilities
- Maintenance Technologies Overview
- No Maintenance
- Reactive Maintenance
- Preventive Maintenance
- Minor PM
- Major PM
- Predictive Maintenance (PdM)
- Proactive Maintenance
- Self-Maintenance
- Where Are We Now?
- Shift from Reactive and Preventive Maintenance to Predictive Maintenance
- The Benefits of Predictive Maintenance
- Requirements for Predictive Maintenance
- Predictive Maintenance Methodologies
- Conclusion
- Case study #8
- Quiz #8
- Emergency Depressurization & Emergency Shut Down (ESD) AND Fire & Gas System
- Emergency Shutdown (ESD) / Emergency Depressurization (EDP)

- Fire & Gas System
- Fire & Gas System Functions
- Case study #9
- Quiz #9
- Importance of Inspection and Test in Asset Integrity Management & Corrosion
- AIM – Asset Integrity Management
- Application of Asset Integrity Management
- Current Trends for AIM
- Corrosion
- Introduction
- Corrosion Types and Associated Agents in the Oil and Gas Industry
- Case Study #10
- Quiz #10
- The Role of Operating Personnel in Maintaining Asset / Operational Integrity
- Operational Integrity
- The Systems: People, Process and Assets
- People
- Assets
- Process
- What Does This Mean?
- Case Study #11
- Quiz #11